5th International Conference on
Biomaterials and Nanomaterials
March 10, 2022 | Webinar

A Numerical Model of Nutrient Diffusion and Consumption in Bio-printed Constructs

Patrizia Gironi
Politecnico Di Milano, Italy

Bioprinting represents a novel promising solution for living tissue fabrication, with several potential advantages in many different applicative sectors. However, the implementation of complex vascular networks remains one of the limiting factors for bioprinting scale-up. In this work, a numerical model is presented to describe nutrients diffusion and consumption phenomena in bio printed droplets. The model allows to assess cell viability and proliferation and can be easily adapted to different cell types, densities, and biomaterials, making it applicable to bio printed tissues of various shapes and sizes. The proposed model constitutes a first step towards a digital twin of bio fabricated constructs which can be usefully included in the basic toolkit for tissue bioprinting

Speaker Biography

Patrizia Gironi received the Master of Science Degree in Biomedical Engineering in 2020. She is currently a PhD candidate working on an interdisciplinary topic involving the Mechanical Engineering and the Mathematical Departments of Politecnico di Milano. Her thesis topic focuses on developing numerical models for bioprinting.

e: patrizia.gironi@polimi.it

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